

T2 Express 2, Pro 2 and Elite 2

Digital Recorder/Players



Each of the three T2 digital recorder/players models (T2 Express 2, Pro 2 and Elite 2) brings full high-definition capture and playback to the video professional. Additionally, each T2 supports real-time HD crossconversion and faster than real-time playlist rendering.

The T2 from Grass Valley, a Belden Brand, is a complete and self-contained SD and HD audio/video playout center. The front-panel transport controls have the look and feel of a traditional VTR, and one record and two output channels support SD and HD content. The crisp, clear LCD front panel can display high-quality images and is complemented by a software application suite for managing and selecting media clips, clip editing and trimming, and playout — including playlist creation.

Featuring extensive rear-panel audio/video connectivity, T2 can also accept files via USB 3.0, or by data transfer over a standard Gigabit Ethernet network including Grass Valley HQ, Grass Valley HQ + Alpha (T2 Elite 2 only), AVC-ULTRA, AVCHD, MPEG-2, P2, ProRes 422, ProRes 4444 (T2 Elite 2 only), TIFF, TGA, XAVC, XAVC S and XDCAM files.

Further, T2 digital recorder/players can be controlled by video production switchers, presentation mixers and audio mixers — to create a powerful presentation system. Every T2 has two playout channels for independent editing and previewing, or for delivering content to two different display systems simultaneously, useful for edge-blending and displaying 3D content.

T2 Express 2 (HDD)

- RAID-0 (500 GB HDD x2)
- 1 TB usable storage — 14 hours recording capacity (Grass Valley HQ: 150 Mb/s) — 36 hours of XDCAM HD422 @ 50 Mb/s

T2 Pro 2 (HDD)

- RAID-10 (500 GB HDD x4)
- 1 TB usable storage — 14 hours recording capacity (Grass Valley HQ: 150 Mb/s) — 36 hours of XDCAM HD422 @ 50 Mb/s

T2 Elite 2 (SSD)

- RAID-0 (1 TB SSD x2)
- 2 TB usable storage — 28 hours recording capacity (Grass Valley HQ: 150 Mb/s) — 72 hours XDCAM HD422 @ 50 Mb/s

T2 Digital Recorder/Players

KEY FEATURES

- True HD support — 720p, 1080i and 1080p24
- Up/downconversion for a wider range of resolutions and application support
- Native import/playback for most standard formats (see list below)
- Synchronize multiple T2s for 4K playback
- Multiformat support (transcoding to Grass Valley HQ AVI) for most standard and broadcast formats (see list below)
- Three decks for the price of one — 1 record and 2 playback channels work independently and simultaneously
- 2-channel synchronized playback for key/fill rolls, edge blend displays, multiscreen and 3D applications
- Embedded audio (8 channels per SDI connection)
- AES/EBU audio supported
- Easy-to-use front panel interface
- Workstation mode included as standard
- Simple on-the-fly editing, including trimming, mark in/out, markers with comments, basic transition effects and insertion of placeholders for playlists
- Robust design — engineered to withstand punishing live event and mobile production environments
- Full back-up and restore feature
- Timecode chase playback with LTC input
- Integration support for third-party control (BVW, GPIO and AMP)
- Ingest management including:
 - MXF XDCAM format support with closed caption data
 - Direct ingest to external media/storage
 - User-defined clip names
 - Scheduler
- Import from Final Cut Pro in QuickTime format using the free Grass Valley HQ codec for Mac onto an exFAT HDD
- Supports ProRes 422 and ProRes 4444 (T2 Elite 2 only)
- Fast playlist rendering speed (up to 10 times real-time)
- Supports 720p to 1080i real-time crossconversion
- File-based operation enhancements including:
 - FTP transfer rate limit to maintain playback performance
 - NTP Synchronization
 - Watch folder transfers
- Direct access to a media folder with EDIUS and the ability to edit a growing file — AVI (Grass Valley HQ) and MXF (XDCAM). T2 Elite 2 only
- Export a growing MXF (XDCAM) file via FTP
- Export to Sony XDCAM drive (U1/U2)
- Media card reader (T2 Elite 2 only) — SD, SD (UHS-II), CF, SxS, 2.5-inch SSD

Applications

- Events and staging
- Auditoriums
- Corporate A/V centers
- Educational facilities
- Broadcast display support
- Regional sports companies
- Switcher support for playback

Full-Featured Front Panel



NATIVE IMPORT/PLAYBACK FORMATS

AVC ULTRA (AVC-Intra 200; AVC LongG 50/25)
 AVCHD (H.264/AVC)
 AVI (DV, DVCPRO, DVCPRO 50, DVCPRO HD, Grass Valley HQ, Grass Valley HQ + Alpha)
 GF (DV, DVCPRO, DVCPRO 50, MPEG-2)
 MXF (Grass Valley HQ, AVC-Intra 50, AVC-Intra 100, AVC-Intra 200, D10, DV, DVCPRO, DVCPRO 50, DVCPRO HD, H.264/AVC, MPEG-2)
 P2 (DV, DVCPRO, DVCPRO 50, DVCPRO HD, AVC-Intra 50, AVC-Intra 100)
 XAVC (XAVC HD Intra 100/50; Long422 50/35/25)
 XAVC S (H.264/AVC)
 XDCAM (DV, IMX, MPEG-2)
 XDCAM EX (MPEG-2)
 QuickTime (Grass Valley HQ, ProRes 422 ProRes 422 HQ, ProRes 422 LT, ProRes 422 Proxy) (Grass Valley HQ + Alpha, ProRes 4444 – T2 Elite 2 only)
 MP4 (H.264/AVC)

FILE FORMAT SUPPORT

Transcoding to Grass Valley HQ AVI (except native Playback format)

AVI (Grass Valley HQX, Grass Valley HQX + Alpha, Grass Valley Lossless, uncompressed)
 MPEG-2

MXF (Grass Valley HQX, Grass Valley HQX + Alpha, Grass Valley HQ)

P2 (AVC-Intra 2K 422, AVC-Intra 4K LT, AVC-Intra 4K 422)

QuickTime (Grass Valley HQX, Grass Valley HQX + Alpha, DV, DVCPRO HD, DVCPRO 50, H.264, JPEG2000, animation, Motion JPEG, MPEG-4, Photo JPEG, PNG, ProRes 422, ProRes 4444, QuickTime Video, Sorenson Video 3, uncompressed)

Windows Media (Windows Media Video)

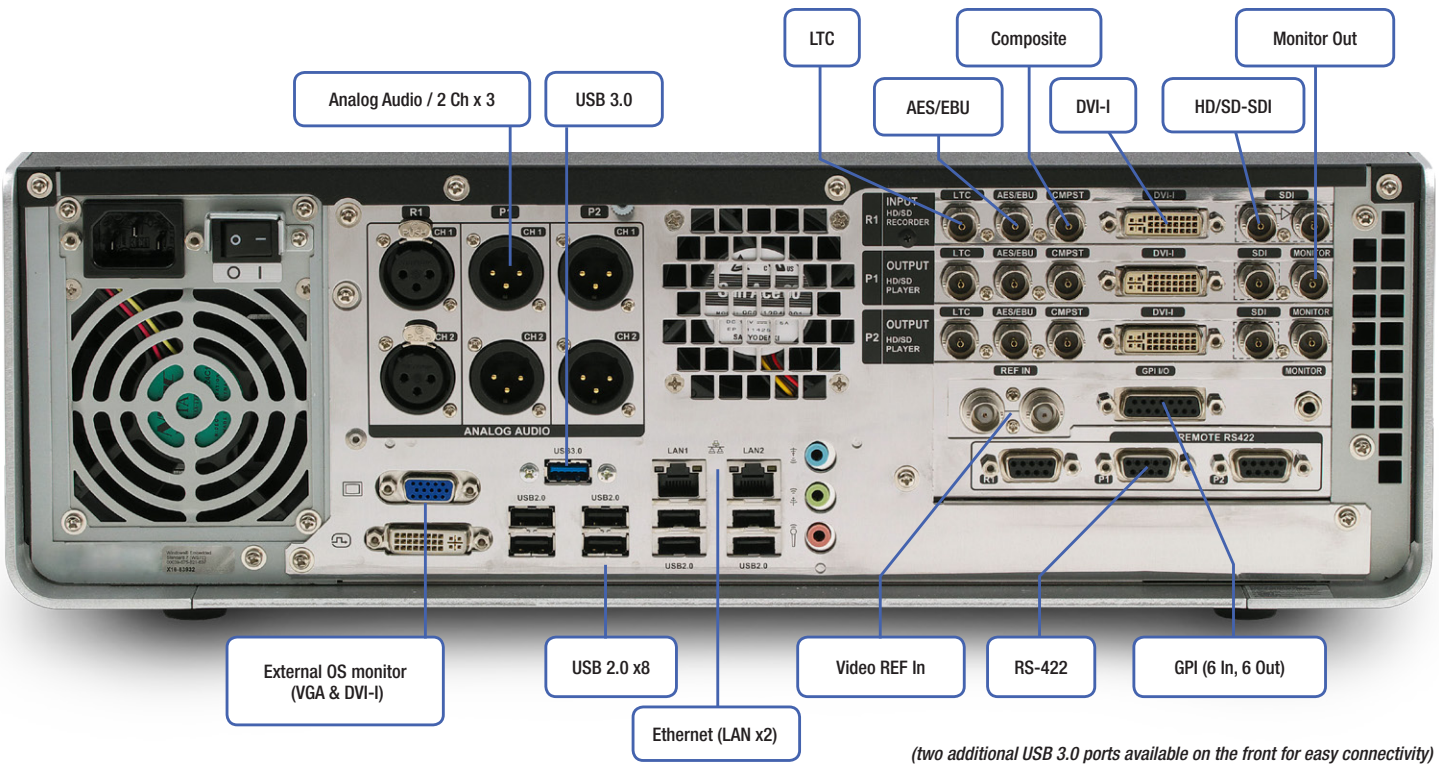
Sequenced files (TGA, BMP, JPG, TIFF, PNG, GIF)

Rewrapping MXF (OP-1a)

GXF (AVC-Intra 100, AVC-Intra 50, D10 DVCPRO HD, DVCPRO50, DVCPRO, DV, MPEG-2)

P2 (DV, DVCPRO, DVCPRO 50, DVCPRO HD, AVC-Intra 50, AVC-Intra 100)

P2 (AVC-Intra 200, AVC-LongG 50, AVC-LongG 25)



ORDERING

iDDR2-Express-2-NA

T2 Express 2:

- Support for USB 3.0
- Support for XAVC, XAVC S, AVC-ULTRA formats
- HDD: 500 GB x 2 (RAID-0), 1 TB usable
- Sold in NAM ONLY

iDDR2-Express-2

T2 Express 2:

- Support for USB 3.0
- Support for XAVC, XAVC S, AVC-ULTRA formats
- HDD: 500 GB x 2 (RAID-0), 1 TB usable
- Sold in EMEA & APAC ONLY

iDDR2-Pro-2-NA

T2 Pro 2:

- Support for USB 3.0
- Support for XAVC, XAVC S, AVC-ULTRA formats
- HDD: 500 GB x 4 (RAID-10), 1 TB usable
- Sold in NAM ONLY

iDDR2-Pro-2

T2 Pro 2:

- Support for USB 3.0
- Support for XAVC, XAVC S, AVC-ULTRA formats
- HDD: 500 GB x 4 (RAID-10), 1 TB usable
- Sold in EMEA & APAC ONLY

iDDR2-Elite-2-NA

T2 Elite 2:

- Media Card Reader Bay: SD, SD (UHS-II), CF, SxS, 2.5-inch SSD
- Support for USB 3.0
- Support for XAVC, XAVC S, AVC-ULTRA formats
- SSD: 1 TB x 2 (RAID-0), 2 TB usable
- Sold in NAM ONLY

iDDR2-Elite-2

T2 Elite 2:

- Media Card Reader Bay: SD, SD (UHS-II), CF, SxS, 2.5-inch SSD
- Support for USB 3.0
- Support for XAVC, XAVC S, AVC-ULTRA formats
- SSD: 1 TB x 2 (RAID-0), 2 TB usable
- Sold in EMEA & APAC ONLY

Import File Compatibility — Transcode Import

Container	Video Codec	Audio Codec	Native Import/ Playback	Transcoding (AVI (HQ))	Rewrap MXF (OP-1a)
AVCHD	H.264/AVC	Dolby Digital (AC-3), Linear PCM	Yes	Yes	—
AVI	Grass Valley HQ, Grass Valley HQ + Alpha, DV, DVCPRO, DVCPRO 50, DVCPRO HD	Linear PCM	Yes	—	—
AVI	Grass Valley Lossless, Grass Valley HQX, Grass Valley HQX + Alpha, uncompressed	Linear PCM	—	Yes	—
GF	DV, DVCPRO, DVCPRO 50, MPEG-2	Linear PCM (48 kHz, 16-bit/24-bit)	Yes	Yes	No
GXF	AVC-Intra 100, AVC-Intra 50, D10, DVCPRO HD, DVCPRO 50, DVCPRO, DV, MPEG-2	Linear PCM, A-law	—	—	Yes
MP4	H.264/AVC*1,4	Linear PCM/MPEG-2 AAC	Yes	Yes	—
MPEG-2	MPEG-2	MPEG-1 Audio Layer-2, Dolby Digital (AC-3), Linear PCM	—	Yes	—
MXF	AVC-Intra 50, AVC-Intra 100, AVC-Intra 200*1, D10, DV, DVCPRO, DVCPRO 50, DVCPRO HD, MPEG-2, H.264/AVC*1,4	Linear PCM, A-law	Yes	Yes	—
MXF	JPEG 2000	Linear PCM, A-law	—	Yes	—
MXF	Grass Valley HQ	Linear PCM	Yes	Yes	—
MXF	Grass Valley HQ + Alpha, Grass Valley HQX, Grass Valley HQX + Alpha	Linear PCM	—	Yes	—
P2	DV, DVCPRO, DVCPRO 50, DVCPRO HD, AVC-Intra 50, AVC-Intra 100, AVC-Intra 200*1, AVC-LongG 50*1, AVC-LongG 25*1	Linear PCM (48 kHz, 16-bit/24-bit)	Yes	Yes	Yes
P2	AVC-Intra 2K 422*3, AVC-Intra 4K LT*3, AVC-Intra 4K 422*3	Linear PCM	—	Yes	No
QuickTime	Grass Valley HQ, Grass Valley HQ + Alpha*2, ProRes 422, ProRes 422 HQ, ProRes 422 LT, ProRes 422 Proxy, ProRes 4444*2	AAC, Apple Lossless, MP3, ADPCM, A-law, U-law, Linear PCM	Yes	Yes	—
QuickTime	Grass Valley HQX, Grass Valley HQX + Alpha, DV, DVCPRO, DVCPRO 50, DVCPRO HD, H.264, JPEG 2000, Animation, MPEG-4, Photo JPEG, PNG, uncompressed, Motion JPEG, Sorenson Video 3, QuickTime Video	AAC, Apple Lossless, MP3, ADPCM, A-law, U-law, Linear PCM	—	Yes	—
Windows Media	Windows Media Video	Windows Media Audio	—	Yes	—
XDCAM	DV, IMX, MPEG-2	8 channels AES3, Linear PCM, A-law	Yes	Yes	—
XDCAM EX	MPEG-2	Linear PCM (48 kHz, 16-bit)	Yes	Yes	—
XAVC	XAVC HD Intra Class 100*1,4/50*1,4, XAVC HD Long422 50*1,4/35*1,4/25*1,4	Linear PCM	Yes	Yes	—
XAVC	XAVC 2K Intra*3, XAVC QFHD Intra Class 480*3/300*3, XAVC QFHD Long 150*3/100*3/60*3, XAVC 4K Intra Class 480*3/300*3	Linear PCM	—	Yes	—
XAVC S	H.264/AVC*1,4	Linear PCM/MPEG-2 AAC	Yes	Yes	—
Still image		—	Yes*5	Yes	—

*1 Output on one channel only (P1 or P2).

*2 ProRes 4444 and Grass Valley HQ + Alpha are supported on the T2 Elite 2 only.

*3 For resolutions greater than 1920x1080, the file will be scaled to HD or SD and then imported.

*4 1920x1080 59.94p or 1920x1080 50p files will automatically be converted to Grass Valley HQ AVI.

*5 Not all supported.

SPECIFICATIONS

T2 Configurations

1 SD/HD input, 2 SD/HD outputs

Video Input

Format Support Types: High-definition, standard-definition

Connections: SD/HD SDI, analog component (Y-Pb-Pr), DVI-I, composite

Recording Formats: AVI-Grass Valley HQ, 4:2:2, XDCAM HD422 (50 Mb/s), HD (25 Mb/s), IMX, DVCAM

Bit Rate: Up to 200 Mb/s

Resolutions SD/Frame Rate: 720x576i50, 720x486i59.94

Resolutions HD/Frame Rate: 1920x1080i59.94, 1920x1080i50, 1920x1080p24, 1920x1080PsF24, 1920x1080p23.98, 1920x1080PsF23.98, 1440x1080i59.94, 1440x1080i50, 1440x1080p24, 1440x1080PsF24, 1440x1080p23.98, 1440x1080PsF23.98, 1280x720p59.94, 1280x720p50

Video Outputs

Format Support Types: High-definition, standard-definition, computer

Connections: SD/HD SDI (one for each playback channel), analog component, DVI-I (one for each playback channel, except RGB), composite

Playback Format (Native Import/Playback):

AVC ULTRA (AVC-Intra 200; AVC LongG 50/25)
 AVCHD (H.264/AVC)
 AVI (DV, DVCPRO, DVCPRO 50, DVCPRO HD, Grass Valley HQ, Grass Valley HQ + Alpha)
 GF (DV, DVCPRO, DVCPRO 50, MPEG-2)
 MXF (Grass Valley HQ, AVC-Intra 50, AVC-Intra 100, AVC-Intra 200, D10, DV, DVCPRO, DVC-PRO 50, DVCPRO HD, H.264/AVC, MPEG-2)
 P2 (DV, DVCPRO, DVCPRO 50, DVCPRO HD, AVC-Intra 50, AVC-Intra 100)
 XAVC (XAVC HD Intra 100/50; Long422 50/35/25)
 XAVC S (H.264/AVC)
 XDCAM (DV, IMX, MPEG-2)
 XDCAM EX (MPEG-2)
 QuickTime (Grass Valley HQ, ProRes 422 ProRes 422 HQ, ProRes 422 LT, ProRes 422 Proxy) (Grass Valley HQ + Alpha, ProRes 4444 – T2 Elite 2 only)
 MP4 (H.264/AVC)

Bit Rate: Up to 200 Mb/s per channel

Resolutions SD/Frame Rate: 720x576i50, 720x486i59.94

Resolutions HD/Frame Rate: 1920x1080i59.94, 1920x1080i50, 1920x1080p24, 1920x1080PsF24, 1920x1080p23.98, 1920x1080PsF23.98, 1280x720p59.94, 1280x720p50, 1280x720p23.98

Computer Resolutions: 1280x1024, 1024x768, 800x600, 640x480

Audio Input

Analog Audio: 2 channels, XLR connections

Digital:

AES/EBU (2 channels), BNC connections
 Embedded audio on SDI, HD or SD (8 channels)

Recording Format: 24-bit, PCM, 48 kHz sampling (20-bit PCM for SD-SDI)

Audio Output

Analog Audio: 2 channels per output video, XLR connections

Digital:

AES/EBU (2 channels), BNC connections
 Embedded audio on SDI, HD or SD (8 channels)

Recording Format: 24-bit, PCM, 48 kHz sampling (20-bit PCM for SD-SDI)

Export File Compatibility

Export: Grass Valley HQ, Grass Valley HQ + Alpha, MXF (XDCAM HD422 (50 Mb/s), HD (25 Mb/s), IMX, DV)

Transcoding to Grass Valley HQ AVI:

AVI (Grass Valley HQX, Grass Valley HQ + Alpha, Grass Valley Lossless, uncompressed)
 MPEG-2

MXF (Grass Valley HQX, Grass Valley HQX + Alpha, Grass Valley HQ)

P2 (AVC-Intra 2K 422, AVC-Intra 4K LT, AVC-Intra 4K 422)

QuickTime (Grass Valley HQX, Grass Valley HQX + Alpha, DV, DVCPRO HD, DVCPRO 50, H.264, JPEG2000, animation, Motion JPEG, MPEG-4, Photo JPEG, PNG, ProRes 422, ProRes 4444, QuickTime Video, Sorenson Video 3, uncompressed)

Windows Media (Windows Media Video)

Sequenced files (TGA, BMP, JPG, TIFF, PNG, GIF)

Rewrapping MXF (OP-1a):

GXF (AVC-Intra 100, AVC-Intra 50, D10 DVC-PRO HD, DVCPRO50, DVCPRO, DV, MPEG-2)

P2 (DV, DVCPRO, DVCPRO 50, DVCPRO HD, AVC-Intra 50, AVC-Intra 100)

P2 (AVC-Intra 200, AVC-LongG 50, AVC-LongG 25)

Control

Protocol: BVW (pre-roll/post-roll, variable control in sync mode, audio monitoring with variable speed), GPI, AMP (Advanced Media Protocol) for Grass Valley switchers and external control software

Timecode chase playback with LTC input

Connections: RS-422 (9-pin D Conn per channel), Ethernet

Technology

Connections: Gigabit Ethernet, USB 3.0 (compatible with USB 2.0), VGA, DVI-I

Storage Capacity:

T2 Express 2: 1 TB (RAID-0, 500 GB HDD x2), Approx. 14 hours of HD @ Grass Valley HQ (150 Mb/s) – 36 hours XDCAM HD422 @ 50 Mb/s

T2 Pro 2: 1 TB (RAID-10, 500 GB HDD x4), Approx. 14 hours of HD @ Grass Valley HQ (150 Mb/s) – 36 hours of XDCAM HD422 @ 50 Mb/s

T2 Elite 2: 2 TB (RAID-0, 1 TB SSD x2), Approx. 28 hours of HD @ Grass Valley HQ (150 Mb/s) – 72 hours of XDCAM HD422 @ 50 Mb/s

Physical

Dimensions: 550x430x140 mm (21.6x16.9x5.5 in.)

Weight: 15 kg (33 lbs.)

Operating Temperature: 5°C to 35°C (41°F to 95°F)

Options and Accessories

Rackmount Kit

SNFS Option: Required to connect the T2 to a K2 SAN using the SNFS file system.

Note: The T2 can connect to a K2 SAN via FTP without this option.



GVB-1-0325C-EN-DS

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